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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,630	03/06/2002	I-Chao Chung	tba	9132

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EXAMINER
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JULES, FRANTZ F

ART UNIT	PAPER NUMBER
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3617

DATE MAILED: 10/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/091,630

Applicant(s)

CHUNG, I-CHAO

Examiner

Frantz F. Jules

Art Unit

3617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 7-9, 15 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-22 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-9, 15, 18 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 9, 15, 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Higbee (US 1,809,699).

Claims 1-3, 9, 15, 18-19

Higbee teaches all the limitations of claims 1-3, 9, 15, 18-19 by showing in fig. 1 a wheel end assembly comprising a spindle (60) defining an axis of rotation, a first wheel hub (22) supported on said spindle by at least one first bearing (16), a second wheel hub (18) supported on said spindle (60) adjacent to said first wheel hub (22) by at least a second bearing member (14) for rotation about said axis; and at least one bushing constituted by either 20 or 24 or by the combination of (20, 24) mounted between the first and second wheel hubs and axially and radially engaging the first and second wheel hubs relative to the axis to support axial and radial loads between the first and second wheel hubs thereby permitting said first and second wheel hubs (22, 18) to rotate independently from each other.

A fastener (36) is mounted on one end of the spindle (60) to prevent linear movement of the first and second wheel hubs (22, 18) to rotate independently from each other in accordance with claim 2.

Art Unit: 3617

The at least one first bearing member (16) is a single bearing and said at least one second bearing member (14) is a single bearing in accordance with claim 3.

The at least one third bearing (24) is solely supported between the first and second wheel hub (22, 18) to permit the first and second wheel hubs (22, 18) to rotate independently from each other under predetermined conditions in accordance with claims 9.

Said bushing includes first and second abutting surfaces (D, E) perpendicular to one another and said first abutting surfaces (D) axially engages said first wheel hub (22) and said second abutting surface (E) radially engages said first wheel hub (22) in accordance with claim 18.

Said bushing includes first and second abutting surfaces (B, C) perpendicular to one another and said first bearing surfaces (B) axially engages said second wheel hub (18) and said second bearing surface (C) radially engages said second wheel hub (18) in accordance with claim 19.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higbee in view of Kallenberger (US 5,290,069).

Claim 7

Art Unit: 3617

Higbee teaches all the limitations of claim 7 except for a wheel end assembly having a bushing made of bronze which can support bi-directional axial and radial loads. The general concept of using a bushing made of bronze which can support bi-directional axial and radial loads in a drive shaft spindle assembly is well known in the art as illustrated by Kallenberger which discloses in figs. 2-10 a bearing member (110) constituted by a bushing made of bronze which can support bi-directional axial and radial loads, see column 1, lines 16-31. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Higbee to include the use of a bushing member constituted by a bushing made of bronze which can support bi-directional axial and radial loads in his advantageous wheel end assembly as taught by Kallenberger in order to reduce the amount of loading imposed on the first and second bearings during cyclic loading due to impact.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higbee and Kallenberger as applied to claims 1, and 6 above, and further in view of El-Kassouf (US 5,971,413).

#### Claim 8

Higbee and Kallenberger teach all the limitations of claim 8 except for a wheel end assembly having a bushing which is a nylon-coated steel bushing. The general concept of applying a nylon coat to an outer surface of a steel bushing in a drive shaft spindle assembly is well known in the art as illustrated by El-Kassouf which discloses in figs. 2-3 a bearing member constituted by a bushing (46) made of steel which includes nylon coating (92) on its exterior surface, see column 4, lines 30-36. It would have been

Art Unit: 3617

obvious to one of ordinary skill in the art at the time of the invention to modify Higbee to include the use of a bushing made of steel which include a nylon coating on its outside surface in his advantageous wheel end assembly as taught by El-Kassouf in order to reduce heat generated due to friction in the bearing thereby increasing the service life of the bearing.

***Allowable Subject Matter***

6. Claim 20 stand allowable. None of the references of record suggests a wheel end assembly comprising a spindle defining an axis of rotation, a first wheel hub supported on said spindle by at least one first bearing, a second wheel hub supported on said spindle adjacent to said first wheel hub by at least a second bearing member for rotation about said axis; wherein a third wheel hub is positioned on an opposite side of the second wheel hub from the first wheel hub for rotation about said axis and including at least one fourth bearing member for allowing the third and second wheel hubs to rotate independently from each other with said third bearing member mounted between the first and second wheel hubs and said fourth bearing member mounted between the second and third wheel hubs in the manner defined in the instant claim 20. Therefore, claims 21-22, depending therefrom are considered to be objected.

***Response to Arguments***

7. Applicant's arguments filed 08/11/03 have been fully considered but they are moot in view of the new grounds of rejection and of the allowance of claim 20.

Art Unit: 3617

New broader claim 1 as being anticipated by Higbee is properly rejected for the fact that applicant has amended independent claim 1 to include among other limitations the recitation of at least one bushing instead of a third bearing.

Applicant argument that the Examiner had acknowledged that the third bearing member is not a bushing which engages axially and radially the first and second wheel hubs is not understood as the prior art of record Kallenberger was used to illustrate the teaching of a bronze bearing which can support both axial and radial bearing. The bushing member(s) or third bearing member (20, 24) disclosed by Higbee comprises first and second surfaces which are perpendicular to one another and which engages the wheel hubs. It is important to point out that annular gland packing 30 does not prevent shifting of the wheel assembly toward the second wheel hub during operation of the wheel.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 3617

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frantz F. Jules whose telephone number is (703) 308-8780. The examiner can normally be reached on Monday-Thursday and every other Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph S. Morano can be reached on (703) 308-0230. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7687 for regular communications and (703) 305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

Frantz F. Jules  
Examiner  
Art Unit 3617

FFJ

October 10, 2003



S. JOSEPH MORANO  
SUPERVISORY PATENT EXAMINER  
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